LOW-DEPTH NESTABLE TRAY FOR FLUID CONTAINERS

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TECHNICAL FIELD

This invention relates to a low depth nestable tray for use in transporting, storing, and displaying fluid containers, such as bottles.

BACKGROUND ART

Bottles, particularly for soft drinks and other beverages, are often stored and transported in trays. The term "tray" as used herein includes trays, crates, cases, and similar containers having a floor and a peripheral side wall structure. As compared with other materials, plastic trays provide advantages such as strength, durability, and reusability. In order to minimize the storage space of trays as well as to reduce their cost and weight, many trays are constructed to have shallow side and end walls. Such trays are generally referred to as "low depth" trays in which the side and end walls are lower than the height of the stored bottles.

In general, bottles go through a bottling facility and to the bottler's warehouse in the following order: the bottles are filled, sealed, loaded into trays, and then the trays are palletized. A pallet may include multiple layers of trays of a single product, such as soft drinks of the same flavor. Trays in successive layers are stacked or cross-stacked on top of each other, with the bottles bearing most of the load of above-stacked trays. These bulk pallets are stored in a warehouse for shipping to retailers.

In the soft drink industry, there are two methods by which products are shipped to retailers: bulk delivery and route delivery. Bulk delivery is by the pallet, and is typically used for large retailers. Since each pallet contains only trays of a single flavor, retailers must order multiple pallets to ensure that they stock a mixture of products appropriate to meet demand, and must have sufficient space to accommodate all of these pallets. Due the space and sales volume requirements of

bulk delivery, the majority of shipments of soft drinks to smaller retailers is done by the route delivery method. These retailers are generally low volume sellers and have less space for storing and merchandising product. Since route delivery retailers cannot accept entire pallets of one product, they receive a mixture of product in a smaller shipment. For the bottlers or distributors, this means that route delivery orders must be processed by breaking down bulk pallets of product and forming delivery pallets which contain a sorted mixture of products.

One recent advance in the shipping and distribution areas is the use of an automated product handling device marketed as the Tygard Claw® by Tygard Machine and Manufacturing Company of Pittsburgh, Pennsylvania. The Tygard Claw can be installed to the front or side of a conventional forklift carriage, and enables a distributor to pick from a bulk pallet of product one layer at a time. Briefly, the Tygard Claw is a large clamping device with four individual walls that approach a layer of product on a pallet squarely and uniformly by each wall moving toward and away from a pallet layer in a translating motion. The actuators for the walls are equipped so that the walls are touch sensitive in order to lift the product without damage. The use of clamping devices such as the Tygard Claw enables distributors to assemble route delivery pallets from bulk pallets one layer of product at a time without the need for manual picking.

With the aforementioned storage, handling, and delivery processes in mind, there are several features which are desirable for the design of low depth bottle trays. Generally, low depth trays should have a wall structure that provides support for the bottles stored therein while also allowing the bottles to be visible for merchandising purposes. In addition, trays should be designed with structural features which enhance their stability when stacked and cross-stacked. Still further, the wall structure should have sufficient strength and rigidity to withstand automated handling. Lastly, the trays should be lightweight and be easy to manipulate and carry.

While some trays may fulfill these objectives, two important problems are encountered with current low depth trays. First, the side wall construction of

low depth trays often does not allow great enough tolerance for nesting of trays, such that trays can become misaligned and/or stuck together. As a result, conservation of storage space and ease of handling is sacrificed. Second, the side wall structure is often not suited for the automated handling devices and processes described above.

DISCLOSURE OF INVENTION

Therefore, it is an object according to the present invention to provide an improved low depth tray for storing, transporting, and displaying fluid containers.

It is another object according to the present invention to provide a low depth tray for fluid containers which provides greater tolerance for nesting with similar trays when empty.

It is another object according to the present invention to provide a low depth tray for fluid containers constructed to facilitate handling by automated handling devices, such as clamping devices for automated palletizing.

It is another object according to the present invention is to provide a low depth tray for fluid containers that provides stability when stacked and cross-stacked with similar loaded trays.

It is another object according to the present invention to provide a low depth tray for fluid containers which is lightweight and easy to handle.

Accordingly, a low depth tray for fluid containers, such as bottles, is provided. The tray includes a base and a first pair of opposed walls extending upwardly from the base. The tray further includes a second pair of opposed walls extending upwardly from the base and integrally joined with the first pair of opposed walls to form a storage area. Each of the second pair of opposed walls includes an upper wall portion and a lower wall portion, the upper wall portion including first areas having a single-walled construction and second areas for contacting the fluid

containers. When nested with a similar tray, the lower wall portion of an upper tray nests within the corresponding first areas of a tray disposed therebelow.

In one embodiment, each of the second pair of opposed walls includes an upper wall portion and a lower wall portion, where the upper wall portion includes a plurality of alternating first areas having a single-walled construction and second areas a having double-walled construction. When nested with a similar tray, the lower wall portion of an upper tray nests within the corresponding first areas of a tray disposed therebelow.

Preferably, the first areas include upper wall panels, and the second areas include columns for providing lateral support to fluid containers loaded in the tray. In one embodiment, an interior surface of each column is substantially flat, whereas in another embodiment the interior surface of each column is generally concave. The second areas may also include portions extending into the storage area. The upper wall portion is preferably slightly tapered in a downward direction. In one embodiment, the upper wall panels are lower in height than the columns. However, the upper wall panels can be substantially equal in height to the columns, thereby defining a continuous upper edge of the upper wall portion. Still further, the upper wall portion of at least one of the second pair of opposed walls can include a contour or a curved upper or lower surface. The upper wall portion also includes a double-walled transition area immediately above the lower wall panels.

In accordance with the present invention, the lower wall portion includes an alternating arrangement of lower wall panels extending upwardly from the base and cutout portions. In one embodiment, the lower wall panels include inwardly extending protrusions positioned to extend between adjacent fluid containers loaded in the tray.

In further accordance with the present invention, the top surface of the base is substantially flat and includes an open grid-work configuration. Preferably, the bottom surface of the base has a plurality of receiving areas for receiving the tops of similar fluid containers in a layer in a similar tray beneath the

base. In one embodiment, at least one member is provided extending upwardly from an interior portion of the base top surface.

In a preferred embodiment, each of the first pair of opposed walls includes a handle portion. The handle portion includes a top bar which can protrude above an upper edge of the first pair of opposed walls, or can alternatively be coplanar with an upper edge of the first pair of opposed walls. In one embodiment, the top bar includes at least one inwardly extending projection to provide lateral support to fluid containers loaded in the tray.

Still further, the first pair of opposed walls includes an a lower wall portion and an upper wall portion. For the first pair of opposed walls, the upper wall portion preferably has a double-walled construction. The upper wall portion of the first pair of opposed walls includes columns for providing lateral support to fluid containers loaded in the tray, and the lower wall portion of the first pair of opposed walls includes an alternating arrangement of lower wall panels extending upwardly from the base and cutout portions.

In still another embodiment, the tray for bottles includes a floor member having a plurality of bottle support areas a sidewall structure integrally formed with the floor member. The sidewall structure has an upper wall portion and a lower wall portion, such that the upper wall portion has at least one double-walled area, and the lower wall portion has a single wall construction. Further, the lower wall portion includes an inner surface having a plurality of inwardly extending protrusions positioned to extend between adjacent bottles positioned in the tray.

The above objects and other objects, features, and advantages of the present invention are readily apparent from the following detailed description of the best mode for carrying out the invention when taken in connection with the accompanying drawings.

BRIEF DESCRIPTION OF DRAWINGS

FIGURE 1 of the drawings is a perspective view of a first embodiment of a low depth nestable tray according to the present invention;

FIGURE 2 is a top plan view of the tray of FIG. 1;

FIGURE 3 is a bottom plan view of the tray of FIG. 1;

FIGURE 4 is a front side elevational view of the tray of FIG. 1;

FIGURE 5 is a right side elevational view of the tray of FIG. 1, the left side being a mirror image thereof;

FIGURE 6 is a cross-section of the tray taken along line 6-6 of FIG. 2;

FIGURE 7 is a cross-section of the tray taken along line 7-7 of FIG. 2;

FIGURE 8 is a cross-section of the tray taken along line 8-8 of FIG. 2;

FIGURE 9 is a cross-section of the tray taken along line 9-9 of FIG. 2;

FIGURE 10 is a perspective view of the embodiment of FIG. 1 shown filled with a 4 x 6 array of fluid containers;

FIGURE 11 is a perspective view of a second embodiment of a low depth nestable tray according to the present invention;

FIGURE 12 is a top plan view of the tray of FIG. 11;

FIGURE 13 is a bottom plan view of the tray of FIG. 11;

FIGURE 14 is a front side elevational view of the tray of FIG. 11;

FIGURE 15 is a right side elevational view of the tray of FIG. 11, the left side being a mirror image thereof;

FIGURE 16 is a cross-section of the tray taken along line 16-16 of FIG. 12;

FIGURE 17 is a cross-section of the tray taken along line 17-17 of FIG. 12;

FIGURE 18 is a cross-section of the tray taken along line 18-18 of FIG. 12;

FIGURE 19 is a cross-section of the tray taken along line 19-19 of FIG. 12;

FIGURE 20 is a perspective view of the tray of FIG. 11 shown filled with a 4 x 6 array of fluid containers;

FIGURE 21 is a perspective view of a third embodiment of a low depth nestable tray according to the present invention;

FIGURE 22 is a top plan view of the tray of FIG. 21;

FIGURE 23 is a bottom plan view of the tray of FIG. 21;

FIGURE 24 is a front side elevational view of the tray of FIG. 21, the rear side elevational view being a mirror image thereof;

FIGURE 25 is a right side elvational view of the tray of FIG. 21, the left side being a mirror image thereof;

FIGURE 26 is a cross-section of the tray taken along line 26-26 of FIG. 22;

FIGURE 27 is a cross-section of the tray taken along line 27-27 of FIG. 22;

FIGURE 28 is a cross-section of the tray taken along line 28-28 of FIG. 22;

FIGURE 29 is a perspective view of the tray of FIG. 21 shown filled with a 4 x 6 array of fluid containers;

FIGURE 30 is a perspective view of the tray of FIG. 21 shown in a nested position with a like tray;

FIGURE 31 is a perspective view of a fourth embodiment of a low depth nestable tray according to the present invention;

FIGURE 32 is a top plan view of the tray of FIG. 31;

FIGURE 33 is a bottom plan view of the tray of FIG. 31;

FIGURE 34 is a front side elevational view of the tray of FIG. 31, the rear side view being a mirror image thereof;

FIGURE 35 is a right side elevational view of the tray of FIG. 31, the left side being a mirror image thereof;

FIGURE 36 is a cross-section of the tray taken along line 36-36 of FIG. 32;

FIGURE 37 is a cross-section of the tray taken along line 37-37 of FIG. 32;

FIGURE 38 is a cross-section of the tray taken along line 38-38 of FIG. 32;

FIGURE 39 is a perspective view of the tray of FIG. 31 shown filled with a 4 x 6 array of fluid containers;

FIGURE 40 is a perspective view of the tray of FIG. 31 shown in a nested position with a like tray;

FIGURE 41 is a perspective view of a fifth embodiment of a low depth nestable tray according to the present invention;

FIGURE 42 is a top plan view of the tray of FIG. 41;

FIGURE 43 is a bottom plan view of the tray of FIG. 41;

FIGURE 44 is a front side elevational view of the tray of FIG. 41, the rear side view being a mirror image thereof;

FIGURE 45 is a right side elevational view of the tray of FIG. 41, the left side being a mirror image thereof;

FIGURE 46 is a cross-section of the tray taken along line 46-46 of FIG. 42;

FIGURE 47 is a cross-section of the tray taken along line 47-47 of FIG. 42;

FIGURE 48 is a cross-section of the tray taken along line 48-48 of FIG. 42;

FIGURE 49 is a perspective view of the tray of FIG. 41 shown filled with a 4 x 6 array of fluid containers;

FIGURE 50 is a perspective view of the tray of FIG. 41 shown in a nested position with a like tray;

FIGURE 51 is a perspective view of a sixth embodiment of a low depth nestable tray according to the present invention;

FIGURE 52 is a top plan view of the tray of FIG. 51;

FIGURE 53 is a bottom plan view of the tray of FIG. 51;

FIGURE 54 is a front side elevational view of the tray of FIG. 51, the rear side view being a mirror image thereof;

FIGURE 55 is a right side elevational view of the tray of FIG. 51, the left side being a mirror image thereof;

FIGURE 56 is a cross-section of the tray taken along line 56-56 of FIG. 52;

FIGURE 57 is a cross-section of the tray taken along line 57-57 of FIG. 52;

FIGURE 58 is a cross-section of the tray taken along line 58-58 of FIG. 52;

FIGURE 59 is a perspective view of the tray of FIG. 51 shown filled with a 4 x 6 array of fluid containers; and

FIGURE 60 is a perspective view of the tray of FIG. 51 shown in a nested position with a like tray.

BEST MODE FOR CARRYING OUT THE INVENTION

FIGS. 1-10 illustrate a first embodiment of a low depth tray 100 according to the present invention. While tray 100 is suited for many uses, tray 100 is particularly suitable for storing and transporting fluid containers, such as bottles B (see FIG. 10). Referring first to the perspective view of FIG. 1, tray 100 includes a base 102 or floor member, a first pair of opposed walls 104, 106, and a second pair of opposed walls 108, 110. For convenience, and without additional limitation, first pair of opposed walls 104, 106 will be referred to herein as end walls, and second pair of opposed walls 108, 110 will be referred to herein as side walls. End walls 104, 106 and side walls 108, 110 are integrally joined with base 102 and extend upwardly therefrom. End walls 104, 106 and side walls 108, 110 are also integrally joined with each other such that end walls 104, 106, side walls 108, 110, and base 102 together form a storage area for bottles B, as shown in FIG. 10. The corners of base 102, end walls 104, 106, and side walls 108, 110 are preferably rounded on both the interior and exterior surfaces of tray 100.

Tray 100 is typically formed of various types of plastic or polymeric materials, such as high density polyethylene (HDPE), by an injection molding or other plastic molding process suitable to this application. Preferably, tray 100 is molded integrally as a single component. As is well understood in the art, the wall thickness of base 102, walls 104, 106, 108, 110, and other components illustrated and disclosed herein may vary depending on the intended usage and other characteristics desired from tray 100. Although a rectangular low depth tray 100 is shown and described herein, the present invention is not limited thereto and may include end walls 104, 106 and side walls 108, 110 of equal length forming a tray 100 of square dimensions. In addition, end walls 104, 106 and side walls 108, 110 are preferably tapered slightly inwardly from their uppermost surfaces to their lowermost surfaces in order to aid in placing trays 100 in a nested configuration and for facilitating handling by automated equipment as described below.

With particular reference to FIGS. 1, 4, 6, and 7, side walls 108, 110 are described below in greater detail. Side walls 108, 110 each include an upper

side wall portion 112 and a lower side wall portion 114. In contrast to prior art low depth trays, upper side wall portion 112 of tray 100 need not include a continuous double wall. Instead, upper side wall portion 112 includes first areas having a single-walled construction and second areas having a double-walled construction. In a preferred embodiment, the first areas include upper side wall panels 116 and the second areas include side wall columns 118 for providing lateral support to fluid containers loaded in tray 100 (as shown in FIG. 10). Side wall columns 118 are preferably hollow between exterior 119 and interior 121 column walls thereof. Interior column wall 121 can be generally concave, or can alternatively be substantially flat. Interior column wall 121 may also include inwardly extending portions (for example, see portions 323 of Figure 21.) Of course, interior columns walls 121 may function to provide support to bottles B without including exterior column walls 119. In such an embodiment, upper side wall portion 112 would have a generally single-walled construction. Side wall columns 118 also include ribs 120 integrally formed therein which partially define a lower side edge 122 of side walls 108, 110, as best shown in FIGS. 3, 8, and 9.

Upper side wall portion 112 includes an alternating arrangement of upper side wall panels 116 and side wall columns 118, as best shown in the perspective view of FIG. 1 and the cross-sectional views of FIGS. 6 and 7. Upper side wall panels 116 are also lower in height than side wall columns 118. This configuration allows for greater display of bottles stored within tray 100. Advantageously, the single-walled construction of upper side wall panels 116 allows greater manufacturing tolerance for nesting with similar trays. In addition, this construction decreases the overall weight of tray 100. Since side wall columns 118 are of double walled construction, tray 100 maintains the requisite strength and rigidity for transport and handling.

Upper side wall portion 112 of at least one of side walls 108, 110 may include a contour 124. For the first embodiment of tray 100, contour 124 is wave-like in appearance, as best shown in FIGS. 1, 4, 6, and 7. Contour 124 forms a structural component of upper side wall portion 112 having an upper contour edge 126 and a lower contour edge 128. Contour 124 may be included on both the

interior and exterior upper side wall portions 112, or alternatively just the exterior may be used.

For use of automated palletizing equipment, such as the Tygard Claw, it is beneficial to have the largest footprint dimension of a tray at its topmost edge. Side walls 118, 120 of tray 100 of the present invention taper from top to bottom, rather than from bottom to top as in some prior art trays. When the Tygard Claw attempts to pick of a layer of trays by engaging the outer trays, this downward taper prevents trays in the middle of a pallet layer from falling out. Therefore, the configuration of upper side wall portion 112 improves the transport and handling of tray 100 of the present invention by automated equipment.

Still referring to FIGS. 1, 4, 6, and 7, lower side wall portion 114 is integrally formed between upper side wall portion 112 and base 102. In the embodiment shown, lower side wall portion 114 includes an alternating arrangement of substantially flat lower side wall panels 130 extending upwardly from base 102 and cutout portions 132. In a preferred embodiment, upper side wall portion 112 includes a double-walled transition area 134 immediately above lower side wall panels 130, as best shown in FIGS. 1, 6, and 7. Cutout portions 132 are preferably disposed directly vertically beneath the corresponding side wall columns 118 such that the typically bulbous bottoms of the bottles can protrude through cutout portions 132, allowing for the tray dimensions to be optimized to the number of bottles carried. Cutout portions 132 also further reduce the weight of tray 100. Preferably, lower side wall panels 130 are single walled such that the weight of tray 100 is again minimized. Although not shown herein, lower side wall portions could alternatively be double-walled or have a continuous solid wall construction.

Referring now to FIGS. 1, 5, 8, and 9, end walls 104, 106 will now be described. End walls 104, 106 are generally symmetric and each include a lower end wall portion 136 and an upper end wall portion 138, wherein upper end wall portion 138 has a lower end edge 139 continuous with lower side edge 122. However, unlike upper side wall portions 112, upper end wall portions 138 preferably have a double-wall material thickness for added strength. Of course,

upper end wall portion 138 could alternatively have a single-walled construction. Upper end wall portion 138 preferably includes end wall panels 152 provided adjacent to end wall columns 140 which provide lateral support to fluid containers loaded in tray 100. As shown, end wall panels 152 and end wall columns 140 are preferably of the same height to provide a continuous upper end edge 141. Lower end wall portion 136 preferably includes an alternating arrangement of lower end wall panels 142 extending upwardly from base 102 and cutout portions 144. The structure and function of end wall columns 140, lower end wall panels 142, and cutout portions 144 of end walls 104, 106 is substantially similar to side wall columns 118, lower side wall panels 130, and cutout portions 132, respectively, described above with reference to side walls 108, 110.

Referring again to FIGS. 1, 5, 8, and 9, end walls 104, 106 further include handle portions 146 which are integrally molded therein to facilitate carrying tray 100. Each handle portion 146 includes a top bar 148, which together with lower end wall portion 142 defines a handle opening or slot 150 through which a user can extend his/her hand. Top bar 148 is supported by end wall panels 152, and top bar 148 is preferably outwardly offset from end wall panels 152 to enhance hand clearance when the tray is filled with bottles. In the embodiment of tray 100 shown in FIGS. 1-10, top bar 148 has an arcuate shape and protrudes above upper end edge 141. With this design, top bar 148 prohibit tray 100 from lying flat if turned upside down, thereby deterring the misuse of trays 100. Furthermore, top bar 148 includes at least one inwardly extending projection 153 to provide additional lateral support to fluid containers loaded in tray 100. Still further, supports 155 are located beneath slot 150 on lower end wall portion 142 in general alignment with projections 153 to further support bottles B. Both projections 153 and supports 155 can be either substantially flat or, alternatively, be generally concave. Handle portions 146 or an alternate handle configuration may be provided on side walls 108, 110 in addition to end walls 104, 106 such that a gripping structure is disposed on each side of tray 100.

In handling a loaded tray, the palm-up position refers to the position of a user's hands when the fingers are wrapped under top bar 148 from the outside

of tray 100. The palm-down position refers to the position of a user's hands when the fingers are wrapped over top bar 148 from the outside of tray 100. The height of top bar 148 and the width of slot 150 ensure that a user's hand has sufficient clearance to grasp top bar 148 in either the palm-up or palm-down positions. Providing a user with the option of handling tray 100 in either hand position helps alleviate fatigue and prevent hand-wrist injuries since a natural grasping motion can be used. The importance of this feature can be appreciated when tray 100 is loaded with bottles B, as shown in FIG. 10.

When trays 100 are nested, lower side edge 122 of an upper tray rests against the top surfaces of side wall columns 118 of a lower tray (see FIGS. 30, 40, 50, and 60). Furthermore, lower end edge 139 of an upper tray rests against upper end edge 141 of a lower tray. Side wall columns 118 are generally aligned with cutout portions 132 of an upper tray, and end wall columns 140 are generally aligned with cutout portions 144 of an upper tray. Therefore, lower side wall panels 130 of an upper tray are received generally between side wall columns 118 of a lower tray to nest within the corresponding upper side walls panels 116.

As best shown in the top and bottom plan view of FIGS. 2 and 3, respectively, base 102 is preferably constructed to have a lattice-like configuration having a pattern of open spaces. This open gridwork design of base 102 provides a lightweight tray 100, and is practical for allowing any liquids to drain through base 102. Of course, base 102 could include any design suitable for supporting fluid containers.

With reference to FIGS. 1 and 2, base 102 has a top surface 154 which includes a plurality of fluid container support areas 156 for supporting bottles thereon. Support areas 156 are configured so that bottles are retained in relatively close relation to provide lateral support to one another and to prevent jostling of the bottles during handling. Excess movement of the bottles is to be avoided in order to ensure that the bottles remain in a vertically upright position to most advantageously bear the load of bottles stacked or cross-stacked above. Support areas 156 are arranged in rows and columns to thereby define one or more arrays.

In tray 100, a four-by-six array of support areas 156 accommodates twenty-four individual twenty-ounce bottles. Of course, depending on the desired container size/volume, trays according to the present invention may be designed to hold arrays of varying sizes.

As shown in FIGS. 1 and 2, base top surface 154 is preferably substantially flat in order to accommodate a variety of bottles. More particularly, a flat top surface 154 permits retention of bottles regardless of the configuration of their lower surface, and also allows bottles of all types to be rotated with respect to fluid container support areas 156 to facilitate display of the product. Alternatively, base top surface 154 can be formed with small depressions (not shown) corresponding to the locations and configurations of the bottoms of the bottles to be supported at each of the support areas 156.

As best shown in the bottom plan view of FIG. 3, base 102 has a bottom surface 158 which is configured to allow for stacking and cross-stacking (not shown) of loaded trays 100. Cross-stacking is done by rotating a top tray 90 degrees about a vertical axis and lowering it onto a bottom tray or trays. Base bottom surface 158 is formed as a plurality of upwardly recessed receiving areas 160 sized to receive the bottle top of a bottle which is disposed in a lower tray. Receiving areas 160 are defined by a downwardly extending periphery 162 and a plurality of interconnected ribs 164. Each periphery 162 is positioned to provide a range within which the bottle tops in a loaded lower tray may reside and still provide safe stacking and cross-stacking. Therefore, receiving areas 160 retain the loaded trays in a stacked arrangement without free sliding along the tops of the bottles in the lower trays. Once the bottle tops are disengaged from receiving areas 160 (i.e., their stacked or cross-stacked positions), an upper tray 100 may slide along the bottles tops in a similar, lower tray to facilitate handling.

Turning now to FIGS. 11-20, a second embodiment of the tray according to the present invention is illustrated. The reference numerals for FIGS. 11-20 correspond generally with the reference numerals for FIGS. 1-10 except for the change from a "1" to a "2" prefix. While similar in construction to tray 100,

tray 200 includes several additional features. First, lower side wall panels 230 and lower end wall panels 242 of tray 200 are not substantially flat, but rather include inwardly extending protrusions 266 positioned to extend between and separate adjacent fluid containers loaded in tray 200. Protrusions 266 provide considerable additional strength for side walls 208, 210 and end walls 204, 206 and reduce wall warpage. Second, one or more members 268 are provided which extend upwardly from an interior portion of base 202. In particular, as best shown in FIGS. 11 and 12, each member 268 is preferably disposed between four adjacent fluid container support areas 256 as illustrated herein. Members 268 are generally cylindrical in shape and are of a height sufficient to support the bottles while not interfering with the nesting capability of trays 200, as shown in the cross-sectional view of FIGS. 16 and 18. By eliminating the flat surface of base 202, members 268 also help to prevent the use of tray 200 for other than its intended function of holding bottles B. Members 268 can also be used for providing additional lateral support to fluid containers loaded in tray 200. Lastly, in the embodiment of tray 200 shown in FIGS. 11-20, top bars 248 of handle portions 246 are generally coplanar with the upper edge of end walls 204, 206.

FIGS. 21-30 illustrate a third embodiment of the tray of the present invention, wherein reference numerals correspond to those of the first embodiment, except with a "3" prefix. Tray 300 is similar to tray 100 in many respects, however, tray 300 includes a different structure for upper side wall panels 316. More particularly, contour 324 of upper side wall panels 316 is scalloped in design. Advantageously, upper side wall panels 316 are still lower in height than side wall columns 318, allowing for enhanced display of bottles stored within tray 300 as well as a decrease in the weight of tray 300.

A fourth embodiment of the tray of the present invention is shown in FIGS. 31-40, wherein reference numerals correspond to those of the second embodiment except for the change to a "4" prefix. Tray 400 includes the scalloped contour 424 upper side panels 416 described above with reference to tray 300, as well as the lower side panel protrusions 466, members 468, and flush top bar 448 described with reference to tray 200.

A fifth embodiment of the tray of the present invention is shown in FIGS. 41-50, wherein reference numerals correspond to those of the fourth embodiment except for the change to a "5" prefix. Tray 500 is substantially similar in design to tray 400 but omit members 468.

Turning finally to FIGS. 51-60, a sixth embodiment of the tray of the present invention is depicted, wherein reference numerals correspond to those of the first embodiment except for the change to a "6" prefix. Tray 600 is similar to both tray 100 and tray 300 except for the structure of upper side wall panels 616. In this embodiment, upper side wall panels 616 are substantially equal in height to side wall columns 618, such that upper side wall panels 616 and side wall columns 618 define a continuous upper edge 670 of upper side wall portion 612.

Of course, it is understood that the features shown and described for any of these six embodiments of the low depth nestable tray of the present invention are interchangeable, such that trays incorporating features in combinations other than the particular embodiments discussed herein are fully contemplated.

While embodiments of the invention have been illustrated and described, it is not intended that these embodiments illustrate and describe all possible forms of the invention. Rather, the words used in the specification are words of description rather than limitation, and it is understood that various changes may be made without departing from the spirit and scope of the invention.